

WHAT IS CLAIMED IS:

1. A method for fabricating a semiconductor device, comprising  
the steps of:

crystallizing a semiconductor film comprising amorphous  
silicon;

forming a gate insulating film on said semiconductor film;

forming a gate electrode on said gate insulating film, said gate  
electrode having tapered side edges; and

10 forming source and drain regions in said semiconductor film  
by ion doping.

2. A method according to claim 1 wherein said crystallizing said  
semiconductor film is performed by a laser irradiating.

15 3. A method according to claim 1 wherein said source and drain  
regions are formed by said ion doping with at least one of phosphorus and  
boron.

4. A method according to claim 1 wherein said forming said gate  
electrode is performed by a wet etching.

5. A method according to claim 1 wherein said semiconductor  
film comprising amorphous silicon has a thickness of 50 to 150 nm.

20 6. A method for fabricating a semiconductor device, comprising  
the steps of:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;

5           crystallizing said semiconductor film;

forming a gate insulating film on said semiconductor film;

forming a gate electrode on said gate insulating film; and

forming source and drain regions in said semiconductor film

by ion doping.

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7. A method according to claim 6 wherein said channel region is substantially intrinsic type or n-type.

8. A method according to claim 6 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

15           9. A method according to claim 6 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

10. A method according to claim 6 wherein said forming said gate electrode is performed by a wet etching.

20           11. A method according to claim 6 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

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12. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon  
on an insulating surface;

introducing boron into at least a portion of said semiconductor  
film, said portion being to become at least a channel region;

5               crystallizing said semiconductor film;

              forming a gate insulating film on said semiconductor film;

              forming a gate electrode on said gate insulating film, said gate  
electrode having tapered side edges; and

              forming source and drain regions in said semiconductor film

10           by ion doping.

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13. A method according to claim 12 wherein said channel region  
is substantially intrinsic type or n-type.

14. A method according to claim 12 wherein said crystallizing  
said semiconductor film is performed by a laser irradiating.

15           15. A method according to claim 12 wherein said source and drain  
regions are formed by said ion doping with at least one of phosphorus and  
boron.

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16. A method according to claim 12 wherein said forming said  
gate electrode is performed by a wet etching.

20           17. A method according to claim 12 wherein said semiconductor  
film comprising amorphous silicon has a thickness of 50 to 150 nm.

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18. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;

crystallizing said semiconductor film; and

forming source and drain regions in said semiconductor film by ion doping.

*18 S 5 D 3 7* 19. A method according to claim 18 wherein said channel region is substantially intrinsic type or n-type.

20. A method according to claim 18 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

15 21. A method according to claim 18 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

22. A method according to claim 18 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

20 23. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;  
crystallizing said semiconductor film;  
forming a gate insulating film on said semiconductor film;  
5 forming a gate electrode on said gate insulating film; and  
forming source and drain regions in said semiconductor film by ion doping which is performed through said gate insulating film.

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*Df* 24. A method according to claim 23 wherein said channel region is substantially intrinsic type or n-type.

10 25. A method according to claim 23 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

26. A method according to claim 23 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

*mult C7* 15 27. A method according to claim 23 wherein said forming said gate electrode is performed by a wet etching.

28. A method according to claim 23 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

20 29. A method for fabricating a semiconductor device, comprising the steps of:  
forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region; crystallizing said semiconductor film by laser irradiation; forming a gate insulating film on said semiconductor film; forming a gate electrode on said gate insulating film; and forming source and drain regions in said semiconductor film by ion doping.

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30. A method according to claim 29 wherein said channel region is substantially intrinsic type or n-type.

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31. A method according to claim 29 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

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32. A method according to claim 29 wherein said forming said gate electrode is performed by a wet etching.

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33. A method according to claim 29 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

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